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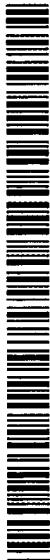
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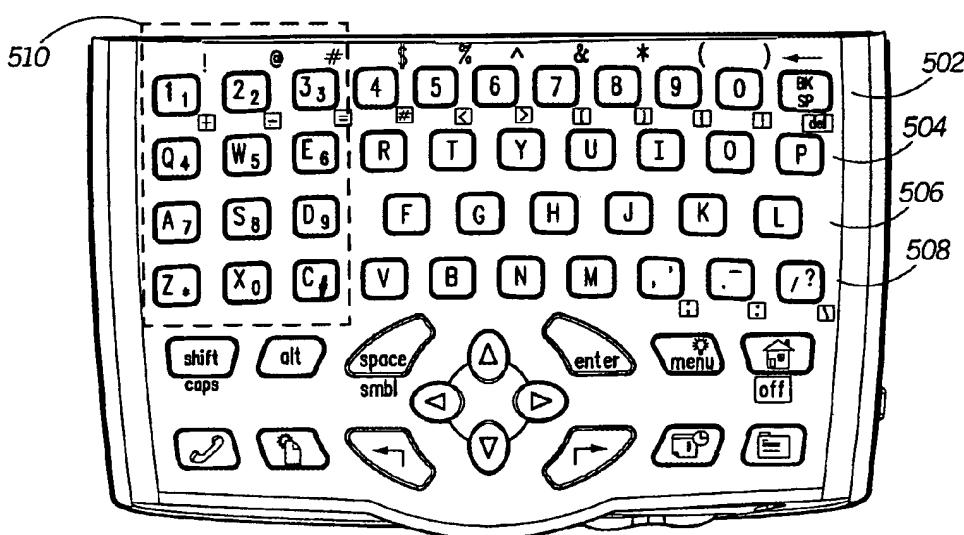
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(54) Title: KEYBOARD HAVING INTEGRATED PHONE KEYPAD



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(57) Abstract: A keyboard suitable for portable wireless communication devices includes a set of keys (202, 204, 206, 208, etc.) organized as a keyboard for entering alphanumeric text, wherein a portion of the set of keys includes keys arranged in a predetermined configuration depicting a numeric keypad (210), the predetermined configuration visually differentiating the portion of the set of keys from the balance of the set of keys of the keyboard.



*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**KEYBOARD HAVING INTEGRATED PHONE KEYPAD****BACKGROUND OF THE INVENTION****5 FIELD OF THE INVENTION**

This invention relates in general to keyboards, and more specifically to a keyboard having an integrated phone keypad.

**DESCRIPTION OF THE RELATED ART**

10        Keyboards are widely used to generate alphanumeric and numeric information. Examples of prior art keyboards include the familiar *qwerty* keyboard found on typewriters, and the *qwerty* keyboards commonly used as entry devices for personal and laptop computers. Conventional *qwerty* keyboards 102, as shown in FIG. 1, have three rows of staggered keys used to 15 enter alphanumeric information and a single row of keys which is used to enter numeric information. The so-called extended keyboards, have in addition to the *qwerty* keyboard a separate calculator style keypad 104, as shown in FIG. 1, which is used to enter numeric information. Other keyboards, such as those found on many laptop computers have a calculator 20 style keypad 204 included as alternate characters of the *qwerty* keyboard 202, as shown in FIG. 2.

In addition, keyboards are rapidly finding their way into communication devices, allowing the user to send text messages and other information. One such example is that of the keyboard used on the 25 "Pagewriter"® two-way pager, shown in FIG. 3. It will be noted that the "Pagewriter" keyboard mimics closely a conventional *qwerty* keyboard with the alphanumeric keys arranged in three staggered rows of keys 304, 306, 308. A single row of numeric keys 302 are arranged in a conventional manner above the alphanumeric keys, however these keys are arranged in a zig-zag 30 fashion to optimize the spacing between keys due to the small overall size of the keyboard.

Such keyboard arrangements as found in the prior art are advantageous for entering alphanumeric and numeric data, such as required for text documents, and when a calculator style keypad is included for entering numbers for computations. These keyboards are not well suited as 5 keyboards for entering phone numbers, because the arrangement of the keys does not mimic that of a conventional telephone style keypad, especially as to the placement of the asterisk (\*) key and pound (#) key.

What is needed is a keyboard which has an telephone style keypad integrated conveniently into a qwerty style keyboard. What is also needed is 10 a keyboard which can be readily implemented on a small portable wireless communication device, and which provides convenient entry of text messages, as well as to provide input for the dialing of phone numbers. What is also needed is a keyboard arrangement which visibly distinguishes the telephone keypad function from the qwerty keyboard function in order to 15 minimize dialing errors.

#### DESCRIPTION OF THE DRAWINGS

The features of the invention which are believed to be novel are set 20 forth with particularity in the appended claims. The invention itself, together with its further objects and advantages thereof, may be best understood by reference to the following description when taken in conjunction with the accompanying drawings, in the several figures of which like reference numerals identify identical elements, in which, and wherein:

25

FIG 1 is a drawing of a prior art extended qwerty keyboard.

FIG. 2 is a drawing of a prior art laptop computer keyboard.

FIG. 3 is a drawing of a prior art keyboard used on a handheld communication device.

30 FIG. 4 is a drawing of a keyboard having an integrated phone keypad in accordance with a first embodiment of the present invention.

FIG. 5 is a drawing of a keyboard having an integrated phone keypad in accordance with a second embodiment of the present invention.

FIG. 6 is a drawing of a keyboard having an integrated phone keypad in accordance with a third embodiment of the present invention.

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## DETAILED DESCRIPTION OF THE INVENTION

FIG. 4 is a drawing of a keyboard having an integrated phone keypad in accordance with a first embodiment of the present invention, a phone 10 qwerty keyboard. As shown in FIG. 4, the keyboard is essentially a conventional qwerty keyboard wherein a portion of the keys corresponding strictly to the qwerty keyboard function are arranged in rows 402, 404, 406, and 408 in a straight line, but can also be arranged along an arc as shown in FIG. 6. As, shown, the keys can have different form factors, such as circular 15 keys for the numeric keys in row 402, and square or rectangular keys for the alphanumeric keys in rows 404, 406, and 408. The portion of the keys corresponding to the phone number keypad 410 are part of the qwerty keyboard, and are arranged in a predetermined configuration which visibly 20 differentiates those keys from the balance of the qwerty keyboard keys. The visible differentiation is provided in a number of ways. The keys forming the 25 qwerty portion of the keyboard in rows 402, 404, 406 and 408 are arranged in staggered rows, mimicking a conventional qwerty keyboard, while that portion of the keys which provide the phone keypad 410 are arranged in ordered columns. The phone keypad 410 is arranged in three columns of four 30 rows of keys, corresponding to a conventional telephone keypad. In addition, the keys providing the phone keypad function can be further differentiated by adding color, such that the portion of the keys forming the phone keypad 410 have a different color from the rest of the keys which provide the balance of the qwerty keyboard function. The combination of the arrangement of the phone keypad keys 410 in a rectangular configuration

together with the color further heightens the visible differentiation of the phone keypad 410 from the balance of the *qwerty* keyboard, keys.

FIG. 5 is a drawing of a keyboard having an integrated phone keypad in accordance with a second embodiment of the present invention. The

5 arrangement of the keyboard of FIG. 5 is similar to that described above for FIG. 4. Unlike FIG. 4, the *qwerty* keyboard keys in rows 502, 504, 506, and 508 are arranged in a straight line. All of the keys of the *qwerty* keyboard also have a common shape, such as square, as shown. Differentiation of the phone keypad 510 is again by arranging the keys in a rectangular  
10 configuration of four rows ordered in straight lines by three columns ordered in straight lines. Color is also used to visibly differentiate the phone keypad 510 from the balance of the *qwerty* keyboard keys. As shown in FIGs. 4 and 5, the *qwerty* keyboard key designations as well as the phone keypad designations are included on the corresponding key.

15 FIG. 6 is a drawing of a keyboard having an integrated phone keypad in accordance with a third embodiment of the present invention. As shown in FIG. 6, the *qwerty* keyboard includes the alphanumeric keys arranged in three rows, 604, 606, 608 along an arc. The keys forming the phone keypad 610 are arranged in a rectangular configuration, but due to the curvature of  
20 the *qwerty* keyboard keys, forms a distinctive parallelogram configuration. The phone keypad 610 keys operate a keys to enter telephone numbers as well as to enter conventional numeric information. As shown in FIG. 6, the *qwerty* keyboard key designations are included on the corresponding key, while the phone keypad key designations are placed adjacent to the  
25 corresponding key.

In summary, what was described above was a keyboard having a set of keys organized as a *qwerty* keyboard (202, 204, 206, 208, etc.) for entering alphanumeric text, wherein a portion of the set of keys includes keys arranged in a predetermined configuration depicting a numeric keypad 210,  
30 the predetermined configuration differentiating that portion of the set of keys from the set of keys of the keyboard. The predetermined configuration of the

portion of the keys is an arrangement of the keys being ordered in four rows of keys by three columns of keys. The arrangement of the keys is essentially rectangular, however can also be in the form of a parallelogram. The keys of the qwerty keyboard can be arranged in a straight line, or can be arranged in 5 an arc. The keys in a first row of the qwerty keyboard are staggered from the keys in an alternate row of the qwerty keyboard, in one arrangement of keys, and can be ordered in straight line columns. The first row of keys of the four rows of keys corresponds to a set of numeric keys of the row 202 of numeric keys of the qwerty keyboard.

10 The phone keypad described above is especially suited for use on portable wireless communication devices. When utilizing as a phone keypad for portable wireless communication devices operating on a GSM radio network, the zero digit key has an alternate function as shown in FIG. 6. The alternate function is designated by the plus (+) symbol and allows the use of 15 phone numbers without an explicit area code or country code designation.

While specific embodiments of this invention have been shown and described, further modifications and improvements will occur to those skilled in the art. All modifications which retain the basic underlying principles disclosed and claimed herein are with the scope and spirit of the present 20 invention.

We claim:

**CLAIMS**

5 1. A keyboard, comprising:

a set of keys organized as a keyboard for entering alphanumeric text,  
wherein

a portion of said set of keys includes keys arranged in a predetermined  
configuration depicting a numeric keypad, said predetermined configuration  
10 differentiating said portion of said set of keys from said set of keys.

2. The keyboard according to claim 1, wherein said predetermined  
configuration of said portion of said keys is an arrangement of said keys  
being ordered in four rows of keys by three columns of keys.

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3. The keyboard according to claim 2, wherein said arrangement of said  
keys is rectangular.

20

4. The keyboard according to claim 1, wherein said set of keys is  
arranged as a *qwerty* keyboard.

5. The keyboard according to claim 4, wherein said keys of said *qwerty*  
keyboard are arranged in a straight line.

25

6. The keyboard according to claim 4, wherein said keys of said *qwerty*  
keyboard are arranged in an arc.

30

7. The keyboard according to claim 4, wherein said keys in a first row of  
said *qwerty* keyboard are staggered from said keys in an alternate row of said  
*qwerty* keyboard.

8. The keyboard according to claim 4, wherein said qwerty keyboard includes a row of numeric keys, and three rows of alphanumeric keys.

9. The keyboard according to claim 8, wherein said predetermined 5 configuration of said portion of said keys is an arrangement of said keys being ordered in four rows of keys by three columns of keys.

10. The keyboard according to claim 9, wherein a first row of keys of said 10 four rows of keys corresponds to a set of numeric keys of said row of numeric keys of said qwerty keyboard.

11. The keyboard according to claim 8, wherein said keys of said row of numeric keys and said keys of said three rows of alphanumeric keys have a common shape.

15 12. The keyboard according to claim 11, wherein said keys of said row of numeric keys are rectangular and said keys of said three rows of alphanumeric keys are substantially square.

20 13. The keyboard according to claim 8, wherein said keys of said row of numeric keys and said keys of said three rows of alphanumeric keys have a different shape.

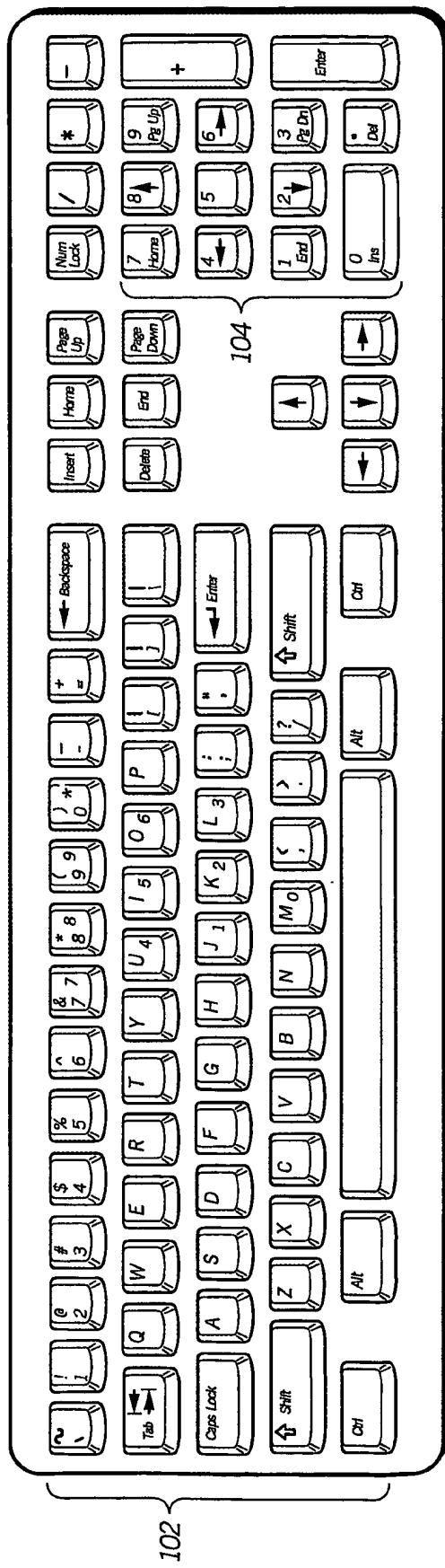
25 14. The keyboard according to claim 13, wherein said keys of said row of numeric keys is round and said keys of said three rows of alphanumeric keys are substantially square.

15. The keyboard according to claim 1, wherein said keys of said portion of said set of keys is a color different from said set of keys.

16. The keyboard according to claim 1, wherein said keys of said portion of said set of keys are identified by numeric characters.

17. The keyboard according to claim 1, wherein said portion of said keys provides a second selectable function for said keys.

18. The keyboard according to claim 17, wherein said second function is a telephone keypad.



PRIOR ART

*FIG. 1*

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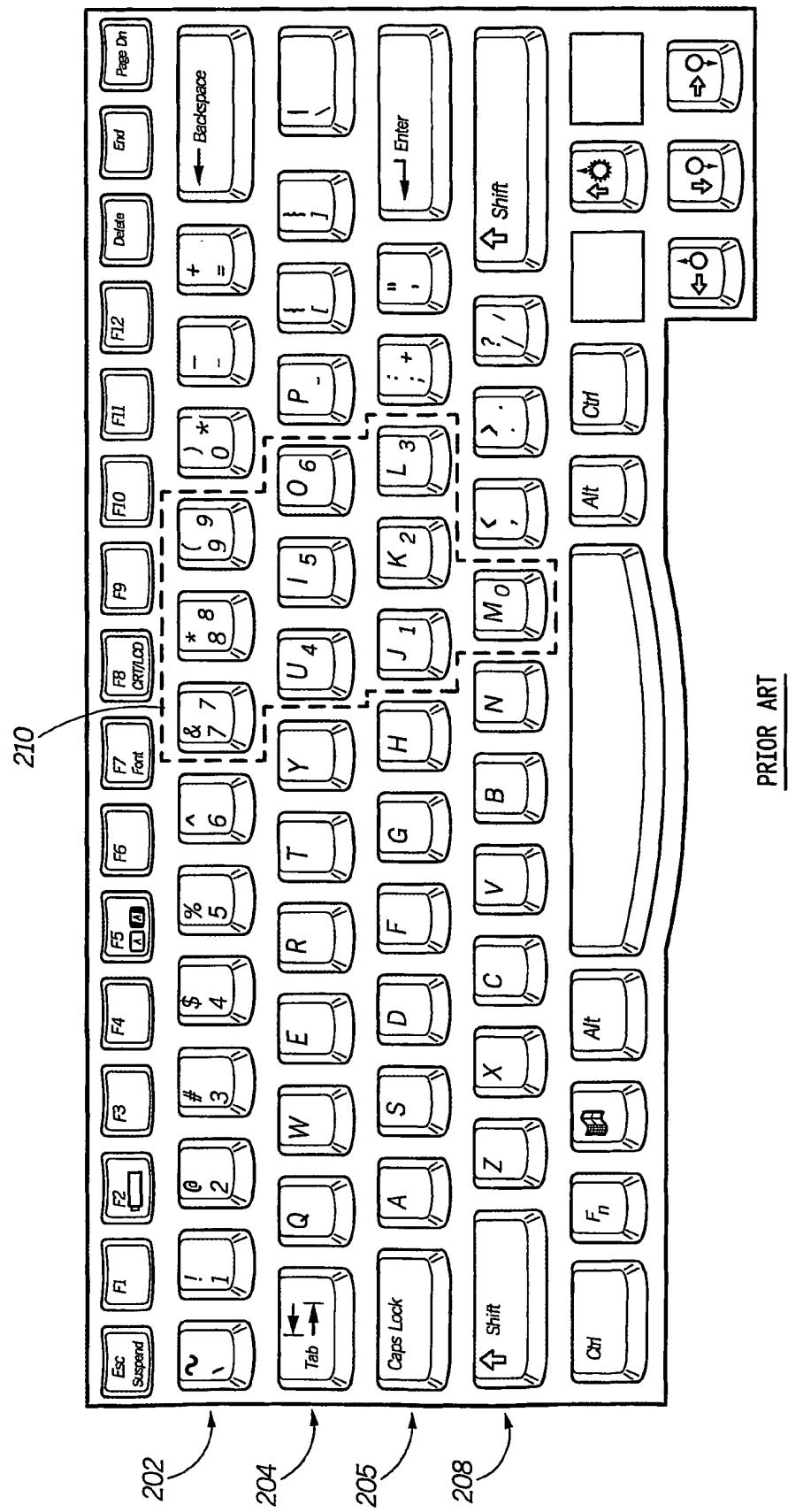
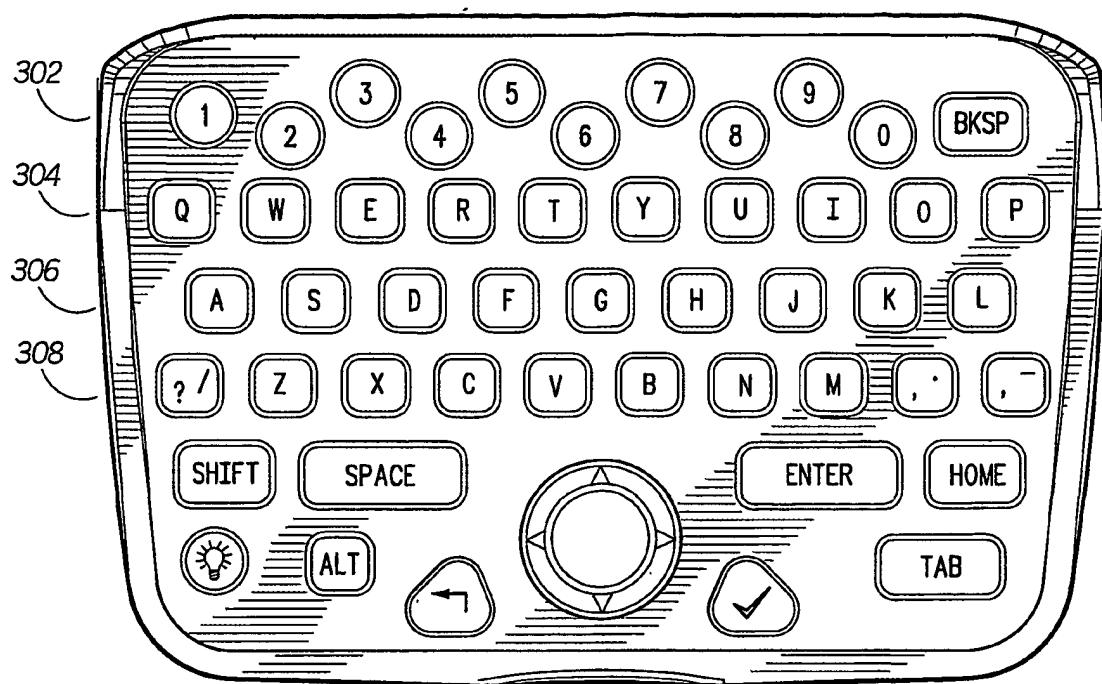
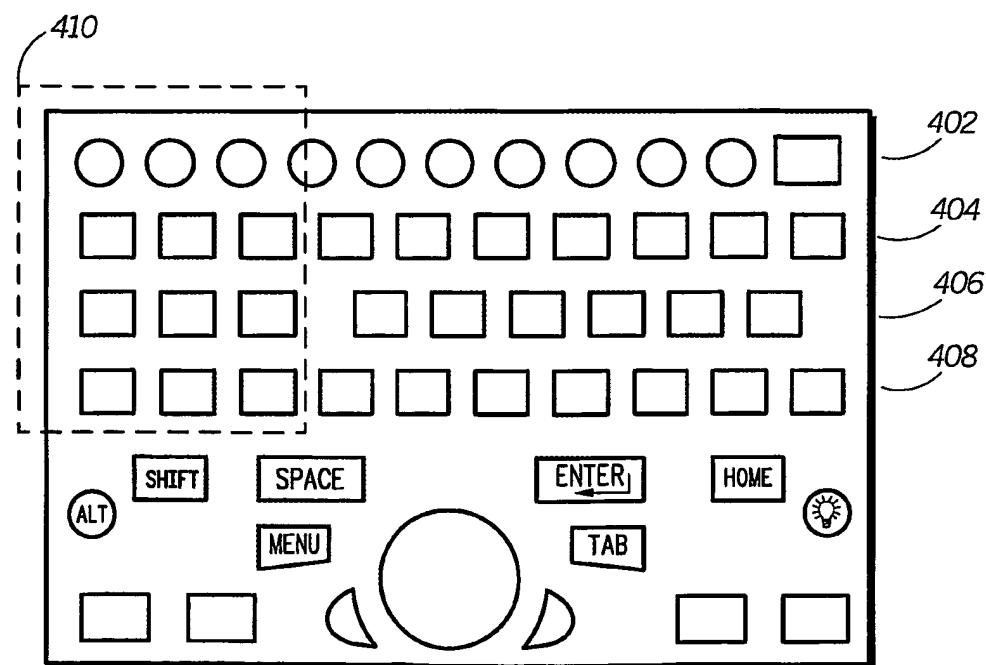
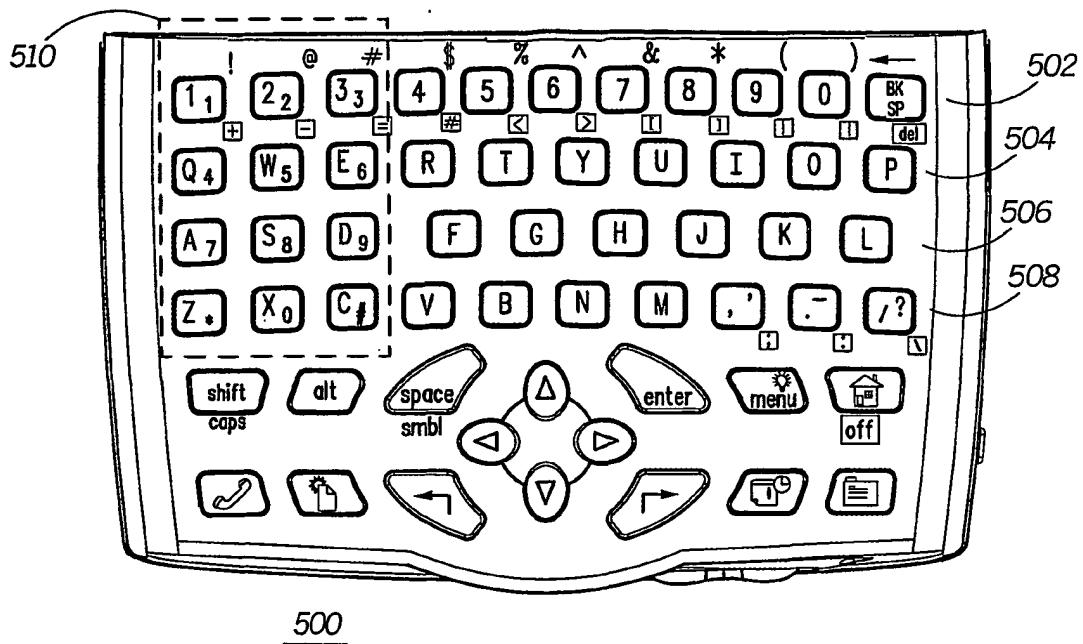
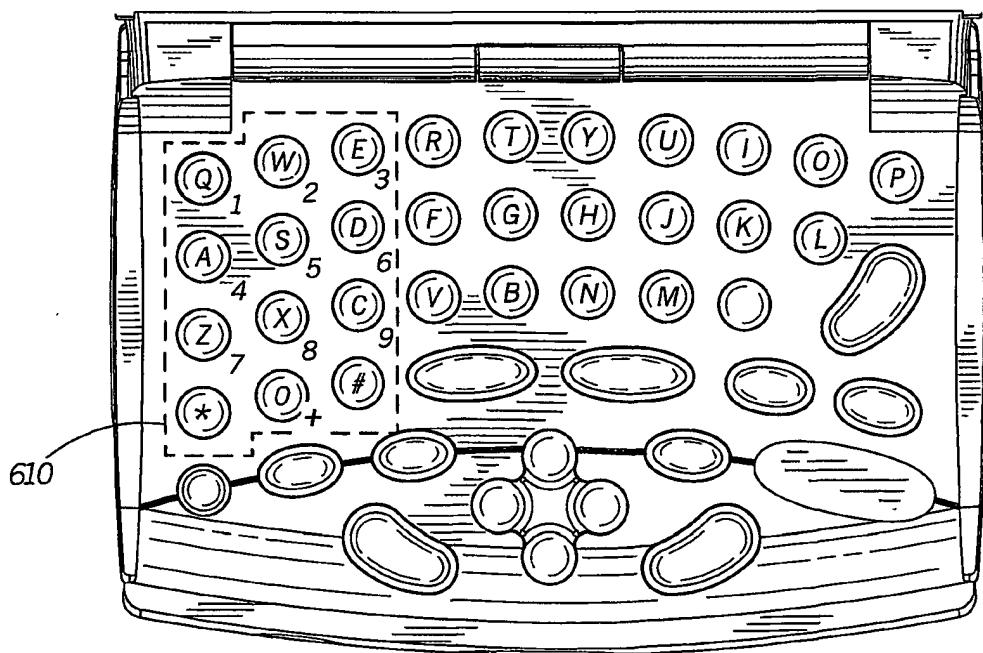


FIG. 2

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PRIOR ART***FIG. 3******FIG. 4***

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*FIG. 5**FIG. 6*

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US01/14511

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : B41J 5/10,5/12,5/14  
US CL : 400/472,486,489

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
U.S. : 400/472,486,489

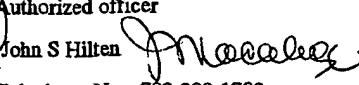
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
USPTO EAST DATABASE

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,047,196 A (Makela et al.) 04 April 2000 (04.04.2000), see figures 1 and 3, columns 3-4.	1-14, 16-18
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Y	column 4, lines 30-35	15

<input type="checkbox"/>	Further documents are listed in the continuation of Box C.	<input type="checkbox"/>	See patent family annex.
* "T"	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search <b>08 August 2001 (08.08.2001)</b>	Date of mailing of the international search report <b>24 AUG 2001</b>
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